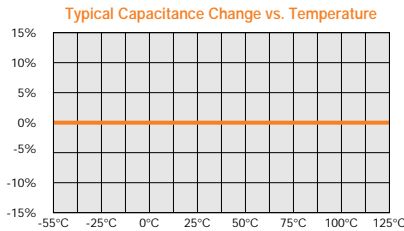


Ceramic Chip Capacitors

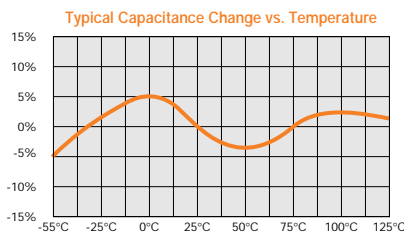
Multilayer chip capacitors have a low residual inductance, an excellent frequency response and minimal stray capacitance since there are no leads. These characteristics enable design to be very close to the theoretical values of the capacitors.

NP0/C0G: SPECIFICATIONS:



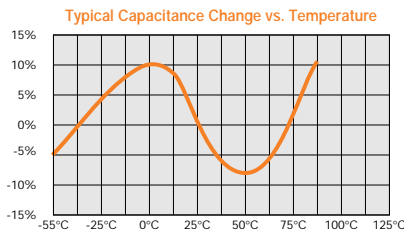
OPERATING TEMPERATURE RANGE:	-55°C to +125°C
TEMPERATURE COEFFICIENT:	0 ±30PPM/°C
TEMPERATURE VOLTAGE COEFFICIENT:	0 ±30PPM/°C
DISSIPATION FACTOR:	0.1% MAX.
INSULATION RESISTANCE:	>1000 ohms F or 100 G ohms, whichever is less at 25°C, VDCW. (The IR at 125°C is 10% of the value at 25°C)
AGEING:	None
WITHSTANDING VOLTAGE:	>2.5 times VDCW
TEST PARAMETERS:	1MHz ± 100kHz at 1.0 ± 0.2 Vrms ≤ 100 pF, 25°C 1KHz ± 100Hz at 1.0 ± 0.2 Vrms > 100 pF, 25°C
CAPACITANCE TOLERANCE:	B,C,D,F,G,J,K

X7R: SPECIFICATIONS:



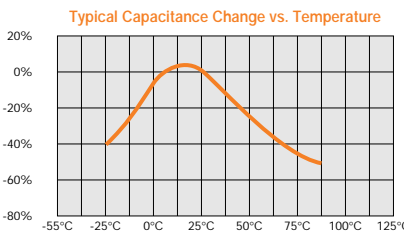
OPERATING TEMPERATURE RANGE:	-55°C to +125°C
TEMPERATURE COEFFICIENT:	0 ±15%Δ°C MAX.
TEMPERATURE VOLTAGE COEFFICIENT:	X7R not applicable
DISSIPATION FACTOR:	For 50 volts and 100 volts: 2.5% MAX.; For 25 volts: 3.0% MAX.; For 16 volts: 3.5% MAX.; For 10 volts: 5.0% MAX.; For 6.3 volts: 10% MAX.
INSULATION RESISTANCE:	For values > 10μF and voltages ≤ 10V, the D.F. is 10% MAX. >1000 ohms F or 100 G ohms, whichever is less at 25°C, VDCW. (The IR at 125°C is 10% of the value at 25°C)
AGEING:	2.5% per decade hour, typical
WITHSTANDING VOLTAGE:	>2.5 times VDCW
TEST PARAMETERS:*	1KHz ± 100Hz at 1.0 ± 0.2 Vrms > 100 pF, 25°C
CAPACITANCE TOLERANCE:	J,K,M

X5R: SPECIFICATIONS:



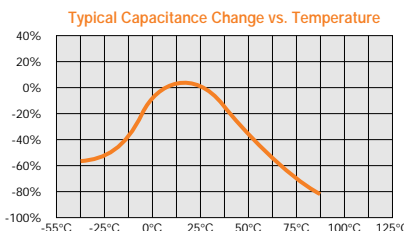
OPERATING TEMPERATURE RANGE:	-55°C to +85°C
TEMPERATURE COEFFICIENT:	0 ±15%Δ°C MAX.
TEMPERATURE VOLTAGE COEFFICIENT:	X5R not applicable
DISSIPATION FACTOR:	For 50 volts and 100 volts: 2.5% MAX.; For 25 volts: 3.0% MAX.; For 16 volts: 3.5% MAX.; For 10 volts: 5.0% MAX.; For 6.3 volts: 10% MAX.
INSULATION RESISTANCE:	For values > 10μF and voltages ≤ 10V, the D.F. is 10% MAX. >1000 ohms F or 100 G ohms, whichever is less at 25°C, VDCW. (10,000 ohms at 125°C)
AGEING:	2.5% per decade hour, typical
WITHSTANDING VOLTAGE:	>2.5 times VDCW
TEST PARAMETERS:*	1KHz ± 100Hz at 1.0 ± 0.2 Vrms > 100 pF, 25°C
CAPACITANCE TOLERANCE:	J,K,M

Z5U: SPECIFICATIONS:



OPERATING TEMPERATURE RANGE:	+10°C to +85°C
TEMPERATURE COEFFICIENT:	+22% - 56%Δ°C MAX.
DISSIPATION FACTOR:	4.0% MAX.
INSULATION RESISTANCE:	>100 ohms F or 10 G ohms, whichever is less at 25°C, VDCW.
AGEING:	5% per decade hour, typical
WITHSTANDING VOLTAGE:	>2.5 times VDCW
TEST PARAMETERS:	1KHz ± 100Hz at 0.5 ± 0.1 Vrms, 25°C
CAPACITANCE TOLERANCE:	M,Z,P

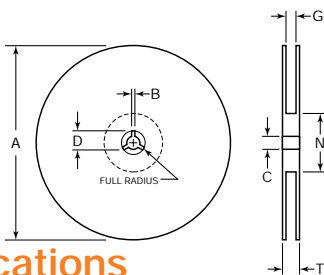
Y5V: SPECIFICATIONS:



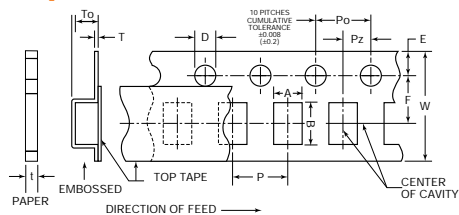
OPERATING TEMPERATURE RANGE:	-30°C to +85°C
TEMPERATURE COEFFICIENT:	+22% - 82%Δ°C MAX.
DISSIPATION FACTOR:	For 25 volts and 50 volts: 5% MAX.; For 16 volts: 7% MAX.; For 10 volts: 9% MAX.; For 6.3 volts: 11% MAX.
INSULATION RESISTANCE:	For higher Cap values > 10μF, the D.F. is 20% MAX. >100 ohms F or 10 G ohms, whichever is less at 25°C, VDCW.
AGEING:	7% per decade hour, typical
WITHSTANDING VOLTAGE:	>2.5 times VDCW
TEST PARAMETERS:*	1KHz ± 100Hz at 1.0 ± 0.2 Vrms, 25°C
CAPACITANCE TOLERANCE:	M,Z

* Test parameters for Hi-Caps: X7R, X5R and Y5V
1KHz ± 100Hz at 1.0 ± 0.2 Vrms ≤ 10uF (10 V min.)
1KHz ± 100Hz at 0.5 ± 0.1 Vrms ≤ 10uF (6.3V max.)
120Hz ± 24Hz at 0.5 ± 0.1 Vrms > 10uF

All tape and reel specifications must be adhered to per EIA-481-1-A as noted and stated in the Chip Resistor section on page 65.



Taping Specifications



Reel Dimensions

Unit: mm (inch)

TAPE	B min	C	A (7")	A (13")	D min	N min	G	T max
8mm	0.3 (.012)	13 ± .05 (.512 ± .02)	178 ± 2.0 (7 ± .079)	330 ± 2.0 (13 ± .08)	20.2 (.795)	50 (1.97)	10 ± 1.5 (.394 ± .059)	14.9 (.587)
12mm	0.3 (.012)	13 ± .05 (.512 ± .02)	178 ± 2.0 (7 ± .079)	330 ± 2.0 (13 ± .08)	20.2 (.795)	50 (1.97)	10 ± 1.5 (.394 ± .059)	14.9 (.587)

7 in. Reel Quantities**

SIZE	01005	0201*	0402*	0603	0805	1206	1210	1812	2221
TAPE SIZE	8mm	8mm	8mm	8mm	8mm	8mm	8mm	12mm	12mm
MIN QTY PER REEL	20,000†	15,000	5000	3000	3000	2000	1000	1000	1000
MAX QTY PER REEL	20,000†	15,000	10,000	4000	5000	5000	5000	3000	1000

** Quantity dependent on Chip Thickness
 * 0201 and 0402 Pitch ("P") is .079" ± .004" (2.0 ± 0.1mm)
 † Smaller quantities may be available. Please contact your sales person.

Paper Tape Carrier Dimensions (8mm)

Unit: mm (inch)

SIZE	A	B	W	F	E	Po	Pz	D	t	P
01005	0.25 ± 0.05 (0.010 ± .002)	0.45 ± 0.05 (0.018 ± .002)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.039 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	1.15 MAX (.045 MAX)	2.0 ± 0.05 (.079 ± .002)
0201	0.37 ± 0.05 (0.014 ± .002)	0.67 ± 0.05 (0.026 ± .002)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.039 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	1.15 MAX (.045 MAX)	2.0 ± 0.05 (.079 ± .002)
0402	0.65 ± 0.1 (.026 ± .004)	1.10 ± 0.2 (.043 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.039 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	1.15 MAX (.045 MAX)	2.0 ± 0.05 (.079 ± .002)
0603	1.10 ± 0.2 (.043 ± .008)	1.90 ± 0.2 (.075 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	1.15 MAX (.045 MAX)	4.0 ± 0.1 (.157 ± .004)
0805	1.16 ± 0.2 (.046 ± .008)	2.4 ± 0.2 (.095 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	1.15 MAX (.045 MAX)	4.0 ± 0.1 (.157 ± .004)
1206	2.0 ± 0.2 (.079 ± .008)	3.6 ± 0.2 (.142 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.064 + .004 - .000)	1.15 MAX (.045 MAX)	4.0 ± 0.1 (.157 ± .004)

Embossed Carrier Dimensions (8mm & 12mm)

SIZE	A	B	W	F	E	Po	Pz	D	To	T	P
0805	1.48 ± 0.2 (.058 ± .008)	2.3 ± 0.2 (.091 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± 0.1 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.06 + .004 - .000)	2.5 MAX (.098 MAX)	0.6 MAX (.024 MAX)	4.0 ± 0.1 (.157 ± .004)
1206	2.0 ± 0.2 (.079 ± .008)	3.6 ± 0.2 (.142 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± .01 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.06 + .004 - .000)	2.5 MAX (.098 MAX)	0.6 MAX (.024 MAX)	4.0 ± 0.1 (.157 ± .004)
1210	2.9 ± 0.2 (.114 ± .008)	3.6 ± 0.2 (.142 ± .008)	8.0 ± 0.2 (.315 ± .008)	3.5 ± .01 (.138 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.06 + .004 - .000)	2.5 MAX (.098 MAX)	0.6 MAX (.024 MAX)	4.0 ± 0.1 (.157 ± .004)
1812	3.6 ± 0.2 (.142 ± .008)	4.9 ± 0.2 (.193 ± .008)	12.0 ± 0.3 (.472 ± .012)	5.6 ± 0.1 (.221 ± .004)	1.75 ± 0.1 (.069 ± .004)	4.0 ± 0.1 (.157 ± .004)	2.0 ± 0.05 (.079 ± .002)	1.5 + 0.1 - 0.0 (.06 + .004 - .000)	3.8 MAX (.150 MAX)	0.6 MAX (.024 MAX)	8.0 ± 0.1 (.315 ± .004)

How To Order

C0805 Series See Chart	C0G Temperature Characteristic	500 Rated Voltage 1st two digits are significant followed by number of zeroes. 6R3 = 6.3 VDCW 100 = 10 VDCW 160 = 16 VDCW 250 = 25 VDCW 500 = 50 VDCW 101 = 100 VDCW 201 = 200 VDCW 251 = 250 VDCW	101 Capacitance (pico - Farads) 1st two digits are significant, followed by number of zeroes. 101 = 100 pF R denotes decimal 6R8 = 6.8 pF	J Tolerance Code: *B = ± 0.1 pF *C = ± 0.25 pF *D = ± 0.5 pF F = ± 1% G = ± 2% J = ± 5% K = ± 10% M = ± 20% N = ± 30% Z = +80 -20% P = +100 -0% * For capacitance values below 10 pF only.	N Termination N = Nickel Barrier, Tinned Termination Composition is 100% matte Tin (Sn) P = Palladium Silver G = Gold over Nickel P: For Palladium Silver Termination (PdAg) add P above. Pb: For 90% Tin (Sn)/10% Lead (Pb) Termination add Pb above. Standard termination finish for this product is 100% matte Tin (Sn)	□ Marking** 6 = EIA "J" Code "Leave blank if No Marking" P = Paper Tape (7" Reel)	P Packaging B = Bulk D = Paper Tape (10" Reel) E = Embossed Tape (7" Reel) R = Paper Tape (13" Reel) U = Embossed Tape (13" Reel)	* Optional Identifier
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** 0201 and 0402 size capacitors cannot be marked

*** OPTIONAL IDENTIFIER**
 Min./Max. thickness
 - designates minimum thickness
 * designates maximum thickness

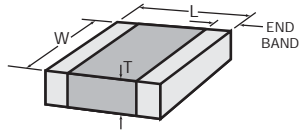
The following letters define thickness as signified below:

CODE:	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	6	9
DIMENSION:	.010	.015	.020	.026	.030	.035	.040	.045	.050	.055	.060	.065	.070	.075	.080	.085	.090	.023	.021

Please Note: Venkel offers Engineering Kits for this product. See page 121 for details.

Ceramic Chip Capacitors

NP0/C0G Dielectric



Values that are typically available.
 25V Available in 25V only.

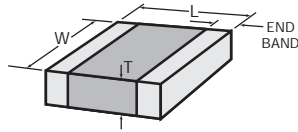
(All measurements in inches)		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
Size		01005 (± 0.0008)	0201 (± 0.002)	0402 (± 0.004)	0504 (± 0.008)	0603 (± 0.006)	0805 (± 0.008)	1206 (± 0.008)	1210 (± 0.008)	1812 (± 0.012)								
L		.016	.024	.040	.050	.063	.080	.126	.126	.177								
W		.008	.012	.020	.040	.032	.050	.063	.098	.126								
T (max)		.008	.012	.025	.040	.033	.055	.070	.075	.085								
Min E/B		.002	.002	.004	.005	.008	.020 ± .010	.020 ± .010	.020 ± .010	.024 ± .015								
VDCW (MAX)		16V	25V	25V	50V	50V	100V	50V	100V	25V	50V	100V	50V	100V	50V	100V	50V	100V
OR5	0.5pF																	
1R0	1.0pF																	
1R2	1.2																	
1R5	1.5																	
1R8	1.8																	
2R2	2.2																	
2R7	2.7																	
3R3	3.3																	
3R9	3.9																	
4R7	4.7																	
5R6	5.6																	
6R8	6.8																	
8R2	8.2																	
100	10pF																	
120	12																	
150	15																	
180	18																	
220	22																	
270	27																	
330	33																	
390	39																	
470	47																	
560	56																	
680	68																	
820	82																	
101	100pF																	
121	120																	
151	150																	
181	180																	
221	220																	
271	270																	
331	330																	
391	390																	
471	470																	
561	560																	
681	680																	
821	820																	
102	1000pF																	
122	1200																	
152	1500																	
182	1800																	
222	2200																	
272	2700																	
332	3300																	

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

NP0/C0G Dielectric



Values that are typically available.
 25V Available in 25V only.

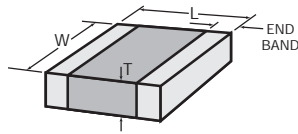
(All measurements in inches)		□		□		□		□		□			□		□		□		□	
Size	0201 (± 0.002)	0402 (± 0.004)		0504 (± 0.008)		0603 (± 0.006)		0805 (± 0.008)			1206 (± 0.008)		1210 (± 0.008)		1812 (± 0.012)		2220 / 2221 (± 0.016)			
L	.024	.040		.050		.063		.080			.126		.126		.177		.225 / .225			
W	.012	.020		.040		.032		.050			.063		.098		.126		.200 / .210			
T (max)	.012	.025		.040		.033		.055			.070		.075		.085		.108 / .108			
Min E/B	.002	.004		.005		.008		.020 ± .010			.020 ± .010		.020 ± .010		.024 ± .015		.025 ± .015			
VDCW (MAX)	25V		25V	50V	50V	100V	50V	100V	25V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	
392	3900																			
472	4700																			
562	5600																			
682	6800																			
822	8200																			
103	.01µF																			
123	.012																			
153	.015																			
183	.018																			
223	.022																			
273	.027																			
333	.033																			
393	.039																			
473	.047																			
563	.056																			
683	.068																			
823	.082																			
104	.100µF											25V								
124	.120																			
154	.150																			
184	.180																			
224	.220																			
274	.270																			
334	.330																			
394	.390																			
474	.470																			
564	.560																			
684	.680																			
824	.820																			
105	1.00µF																			
125	1.20																			
155	1.50																			
185	1.80																			
225	2.20																			
335	3.30																			
395	3.90																			
475	4.70																			
685	6.80																			
106	10.0µF																			
156	15.0µF																			
226	22.0µF																			
476	47.0µF																			
107	100.0µF																			

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

X7R Dielectric



Values that are typically available.
 X5R Available in X5R only. See X5R chart on page 12, for all values 1μF and above

(All measurements in inches)		□			□			□			□					□																	
Size		0201 (± 0.002)			0402 (± 0.004)			0504 (± 0.008)			0603 (± 0.006)					0805 (± 0.008)																	
L		.024			.040			.050			.063					.080																	
W		.012			.020			.040			.032					.050																	
T (max)*		.012			.025			.040			.033					.055																	
Min E/B		.002			.004			.005			.008					.020 ± .010																	
VDCW (MAX)		6.3V		10V		16V		16V		25V		50V		25V		50V		100V		6.3V		10V		16V		25V		50V		100V			
CAP. CODE	101	CAP. VALUE	100pF	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R					
	121		120	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R			
	151		150	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R			
	181		180	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	221		220	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	271		270	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	331		330	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	391		390	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	471		470	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	561		560	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	681		680	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	821		820	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	102		1000pF	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	122		1200	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	152		1500	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	182		1800	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	222		2200	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	272		2700	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	332		3300	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	392		3900	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	472		4700	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	562		5600	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	682		6800	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	822		8200	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	103		.01μF	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	123		.012	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	153		.015	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	183		.018	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	223		.022	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	273		.027	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	
	333		.033	X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R		X5R	

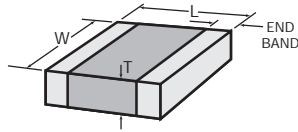
* For values above 1μF, thickness may be greater than specified above.
 T(max): 0603 – 0.048"
 0805 – 0.075"

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

X7R Dielectric



Values that are typically available.
 X5R Available in X5R only. See X5R chart on page 12, for all values 1µF and above

(All measurements in inches)		□			□			□			□					□				
Size		0201 (± 0.002)			0402 (± 0.004)			0504 (± 0.008)			0603 (± 0.006)					0805 (± 0.008)				
L	.024																			
W	.012																			
T (max)*	.012																			
Min E/B	.002																			
VDCW (MAX)	6.3V	10V	16V	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	10V	16V	25V	50V	100V
393	.039	X5R																		
473	.047	X5R																		
563	.056																			
683	.068																			
823	.082																			
104	.100µF	X5R																		
124	.120																			
154	.150																			
184	.180																			
224	.220				X5R															
274	.270																			
334	.330				X5R															
394	.390																			
474	.470				X5R															
564	.560																			
684	.680									X5R	X5R									
824	.820																			
105	1.00µF				X5R															
125	1.20																			
155	1.50																			
185	1.80																			
225	2.20									X5R										
335	3.30																			
475	4.70																			
685	6.80																			
106	10.0µF																			
156	15.0µF																			
226	22.0µF																			
476	47.0µF																			
107	100.0µF																			

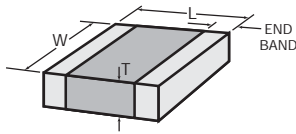
* For values above 1uF, thickness may be greater than specified above.
 T(max): 0603 - 0.048"
 0805 - 0.075"

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

X7R Dielectric



Values that are typically available.
 X5R Available in X5R only. See X5R chart on page 12, for all values 1µF and above

(All measurements in inches)																					
Size		1206 (± 0.008)					1210 (±0.008)					1812 (±0.012)					2220 / 2221 (±0.016)				
L		.126					.126					.177					.225 / .225				
W		.063					.098					.126					.200 / .210				
T (max)*		.070					.075					.085					.108 / .108				
Min E/B		.020 ± .010					.020 ± .010					.024 ± .015					.025 ± .015				
VDCW (MAX)		10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	16V	25V	50V	100V
CAP. CODE	102	1000pF																			
	122	1200																			
	152	1500																			
	182	1800																			
	222	2200																			
	272	2700																			
	332	3300																			
	392	3900																			
	472	4700																			
	562	5600																			
	682	6800																			
	822	8200																			
	103	.01µF																			
	123	.012																			
	153	.015																			
	183	.018																			
	223	.022																			
	273	.027																			
	333	.033																			
	393	.039																			
473	.047																				
563	.056																				
683	.068																				
823	.082																				
104	.100µF																				
124	.120																				
154	.150																				
184	.180																				
224	.220																				
274	.270																				
334	.330																				

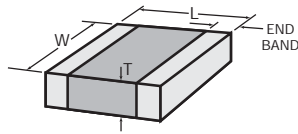
* For values above 1µF, thickness may be greater than specified above.
 T(max): 1206 - 0.110" 1812 - 0.130"
 1210 - 0.125" 2220 - 0.135"

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

X7R Dielectric



Values that are typically available.
 X5R Available in X5R only. See X5R chart on page 12, for all values 1µF and above

(All measurements in inches)																					
Size		1206 (±0.008)					1210 (±0.008)					1812 (±0.012)					2220 / 2221 (±0.016)				
L		.126					.126					.177					.225 / .225				
W		.063					.098					.126					.200 / .210				
T (max)*		.070					.075					.085					.108 / .108				
Min E/B		.020 ± .010					.020 ± .010					.024 ± .015					.025 ± .015				
VDCW (MAX)		10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	16V	25V	50V	100V
CAP. CODE	394	.390																			
	474	.470																			
	564	.560																			
	684	.680																			
	824	.820																			
	105	1.00µF																			
	125	1.20																			
	155	1.50																			
	185	1.80																			
	225	2.20																			
	335	3.30																			
	475	4.70																			
	685	6.80																			
	106	10.0µF																			
	156	15.0µF																			
	226	22.0µF																			
	476	47.0µF																			
	107	100.0µF																			

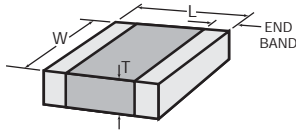
* For values above 1uF, thickness may be greater than specified above.
 T(max): 1206 - 0.110" 1812 - 0.130"
 1210 - 0.125" 2220 - 0.135"

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

X5R Dielectric (Minimum 1µF)



Values that are typically available.

(All measurements in inches)																											
Size		0402 (± 0.004)			0603 (± 0.006)			0805 (± 0.008)				1206 (± 0.008)				1210 (± 0.008)				1812 (± 0.012)				2220 / 2221 (± 0.016)			
L	W	T (max)	Min E/B	VDCW (MAX)	6.3V	4V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	
105	1.00µF																										
125	1.20																										
155	1.50																										
185	1.80																										
225	2.20																										
335	3.30																										

* For values above 1uF, thickness may be greater than specified above.
 T(max): 1206 – 0.110" 1812 – 0.130"
 1210 – 0.125" 2220 – 0.135"

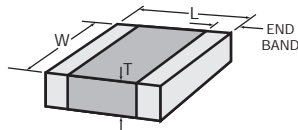
Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

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Ceramic Chip Capacitors

X5R Dielectric (Minimum 1µF)



Values that are typically available.

(All measurements in inches)		□		□		□		□		□		□		□		□		□		□		□			
Size	0402 (± 0.004)	0603 (± 0.006)				0805 (± 0.008)				1206 (± 0.008)				1210 (± 0.008)				1812 (± 0.012)				2220 / 2221 (± 0.016)			
L	.040	.063				.080				.126				.126				.177				.225 / .225			
W	.020	.032				.050				.063				.098				.126				.200 / .210			
T (max)	.025	.033				.055				.070				.075				.085				.108 / .108			
Min E/B	.004	.008				.020 ± .010				.020 ± .010				.020 ± .010				.024 ± .015				.025 ± .015			
VDCW (MAX)	6.3V	4V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	6.3V	10V	25V
CAP. CODE	395	3.90																							
	475	4.70																							
	685	6.80																							
	106	10.0µF																							
	156	15.0µF																							
	226	22.0µF																							
	476	47.0µF																							
	107	100.0µF																							

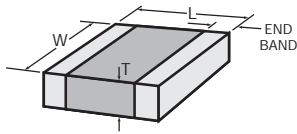
* For values above 1µF, thickness may be greater than specified above.
 T(max): 1206 - 0.110" 1812 - 0.130"
 1210 - 0.125" 2220 - 0.135"

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

Z5U Dielectric



Values that are typically available.

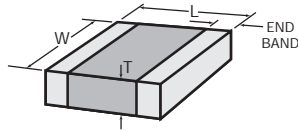
(All measurements in inches)		□		□		□		□		□		□		□	
Size		0504 (± 0.008)		0603 (± 0.006)		0805 (± 0.008)		1206 (± 0.008)		1210 (± 0.008)		1812 (± 0.012)		2220 / 2221 (± 0.016)	
L		.050		.063		.080		.126		.126		.177		.225 / .225	
W		.040		.032		.050		.063		.098		.126		.200 / .210	
T (max)		.040		.033		.055		.070		.075		.085		.108 / .108	
Min E/B		.005		.008		.020 ± .010		.020 ± .010		.020 ± .010		.024 ± .015		.025 ± .015	
VDCW (MAX)		25V	50V	25V	50V	25V	50V	25V	50V	25V	50V	25V	50V	25V	50V
CAP. CODE	102	1000pF													
	122	1200													
	152	1500													
	182	1800													
	222	2200													
	272	2700													
	332	3300													
	392	3900													
	472	4700													
	562	5600													
	682	6800													
	822	8200													
	CAP. VALUE	103	.01µF												
123		.012													
153		.015													
183		.018													
223		.022													
273		.027													
333		.033													
393		.039													
473		.047													
563		.056													
683		.068													
823		.082													
104		.100µF													
124	.120														
154	.150														
184	.180														
224	.220														
274	.270														
334	.330														

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

Z5U Dielectric



Values that are typically available.

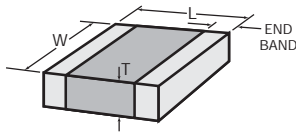
(All measurements in inches)		□		□		□		□		□		□		□		
Size		0504 (± 0.008)		0603 (± 0.006)		0805 (± 0.008)		1206 (± 0.008)		1210 (± 0.008)		1812 (± 0.012)		2220 / 2221 (± 0.016)		
L		.050		.063		.080		.126		.126		.177		.225 / .225		
W		.040		.032		.050		.063		.098		.126		.200 / .210		
T (max)		.040		.033		.055		.070		.075		.085		.108 / .108		
Min E/B		.005		.008		.020 ± .010		.020 ± .010		.020 ± .010		.024 ± .015		.025 ± .015		
VDCW (MAX)		25V 50V		25V 50V		25V 50V		25V 50V		25V 50V		25V 50V		25V 50V		
CAP. CODE	394	CAP. VALUE	.390													
	474		.470													
	564		.560													
	684		.680													
	824		.820													
	105		1.00µF													
	125		1.20													
	155		1.50													
	185		1.80													
	225		2.20													
	335		3.30													
	395		3.90													
	475		4.70													
	685		6.80													
	106		10.0µF													
	156		15.0µF													
	226		22.0µF													
	476		47.0µF													
107	100.0µF															

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

Y5V Dielectric



Values that are typically available.

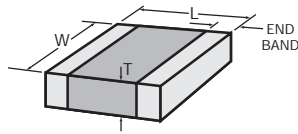
(All measurements in inches)		□		□				□				□				□				□				□				
Size	0201 (± 0.002)	0402 (± 0.004)				0603 (± 0.006)				0805 (± 0.008)				1206 (± 0.008)				1210 (± 0.008)				1812 (± 0.012)						
L	.024	.040				.063				.080				.126				.126				.177						
W	.012	.020				.032				.050				.063				.098				.126						
T (max)	.012	.025				.033				.055				.070				.075				.085						
Min E/B	.002	.004				.008				.020 ± .010				.020 ± .010				.020 ± .010				.024 ± .015						
VDCW (MAX)	10V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	10V	16V	25V	50V	6.3V	10V	16V	25V	6.3V	10V	25V	
102	1000pF																											
122	1200																											
152	1500																											
182	1800																											
222	2200																											
272	2700																											
332	3300																											
392	3900																											
472	4700																											
562	5600																											
682	6800																											
822	8200																											
103	.01µF																											
123	.012																											
153	.015																											
183	.018																											
223	.022																											
273	.027																											
333	.033																											
393	.039																											
473	.047																											
563	.056																											
683	.068																											
823	.082																											
104	.100µF																											
124	.120																											
154	.150																											
184	.180																											
224	.220																											
274	.270																											
334	.330																											

Note:

Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

Ceramic Chip Capacitors

Y5V Dielectric



Values that are typically available.

(All measurements in inches)		□		□		□		□		□		□		□														
Size	0201 (± 0.002)	0402 (± 0.004)				0603 (± 0.006)				0805 (± 0.008)				1206 (± 0.008)				1210 (± 0.008)				1812 (± 0.012)						
L	.024	.040				.063				.080				.126				.126				.177						
W	.012	.020				.032				.050				.063				.098				.126						
T (max)	.012	.025				.033				.055				.070				.075				.085						
Min E/B	.002	.004				.008				.020 ± .010				.020 ± .010				.020 ± .010				.024 ± .015						
VDCW (MAX)	10V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	10V	16V	25V	50V	6.3V	10V	16V	25V	6.3V	10V	25V	
394	.390																											
474	.470																											
564	.560																											
684	.680																											
824	.820																											
105	1.00µF																											
125	1.20																											
155	1.50																											
185	1.80																											
225	2.20																											
335	3.30																											
395	3.90																											
475	4.70																											
685	6.80																											
106	10.0µF																											
156	15.0µF																											
226	22.0µF																											
476	47.0µF																											
107	100.0µF																											

Note: Due to demand and raw material fluctuations in the market, changes and availability of individual values may occur. Minimum order quantities may apply.

All components in this section are RoHS compliant per the EU directives and definitions.